Performance of lambs fed experimental compounds*

Treatment	Level	Average daily gain, kg (%)++	Feed/gain (%)+
Control	–	0.215[a]	6.212[a]
II	15 ppm	0.227 (+5.6)[ab]	6.062 (+2.4)[a]
II	60 ppm	0.238 (+10.7)[b]	5.811 (+6.5)[b]
I	15 ppm	0.243 (+13.0)[c]	5.808 (+6.5)[b]
I	60 ppm	0.239 (+11.2)[b]	5.756 (+7.3)[b]

* Values represent data pooled from 2 42-day lamb-feeding trials conducted with western crossbred wether lambs with an average initial weight of 28.9 kg. All lambs were pretreated with sulfamethazine, chlortetracycline, 2 enterotoxemia injections and levamisole for prophylactic disease control. Lambs were allotted to 5 pens of 6 lambs each per treatment in each experiment. The basal diet contained 48% ground corn, 10% soybean meal, 15% dehydrated alfalfa meal, 15% ground corn cobs, 10% molasses, 0.5% iodized salt, 1.0% dicalcium phosphate and 0.5% trace mineral and vitamin mix. + Values in ( ) represent percent improvement over controls. + Values followed by one or more common superscripts were judged not significantly different from each other ($p = 0.05$).

the table. Evaluation of **I** as a cattle growth stimulant is still in progress. This growth-promoting effect is apparently not attributable to an antibacterial effect, since **I** and **II** are inactive against selected microorganisms, in vitro and in vivo. Investigation of the mode of action of **I** is now being conducted, especially with regard to its effect on the endocrine system.

1 United States adopted name (USAN).
2 We thank Dr T.J. Bentley, D.J. France, and Dr L.D. Spicer for synthesis and structural elucidation work, Dr M.W. Bullock and G.W. Cox for metabolism studies, Drs J. Harter, D. Ingle, J.M. Pensack and L. Wozniak and their associates for biological data, and Drs D.J. Thoennes and M.L. Thomson for spectral data and interpretations.
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On the significance of the rostral process of bipolar neurosecretory cells in the caudal neurosecretory system of certain catfishes

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Summary. Neurosecretory substance has been identified in the rostral process of bipolar neurosecretory cells of the caudal neurosecretory system in 4 Indian catfishes, using acid violet stain. The role of the rostral process in the transmission of the neurosecretory substance is discussed.

The occurrence of bipolar neurosecretory cells alongside ordinary (monopolar) neurosecretory cells in the caudal neurosecretory system of the teleosts has been reported in the common carp and the roach[2]. These bipolar cells are situated anterior to the urophysial swelling, and each possesses 2 principal processes – the rostral process directed away from the swelling, and the caudal process directed towards the swelling. The caudal and rostral processes of these cells do not differ from each other in size or morphology, but whereas the caudal process contains neurosecretory substance, the rostral process is devoid of it. It is believed that the caudal process is associated with the transmission of the neurosecretory substance to the urophysial swelling which acts as a neurohaemal organ. The present investigation aims at throwing light on the possible significance of the bipolar neurosecretory cells, with particular reference to the rostral process that distinguishes them.

Materials and methods. The present study was carried out on 4 locally available catfishes, *Clarias batrachus, Heteropneustes fossilis, Rita rita* and *Mystus vittatus.* The fishes were anesthetized with MS222 (Sandoz) and a portion of the caudal region containing about 10–12 vertebrae from the end was removed. The spinal cord, along with the urophysial swelling and the filum terminale was exposed, fixed in situ in aqueous Bouin's fluid for 18 h, and then finally removed. Paraffin sections were cut 6–8 µm thick, and staining was done with acid violet, which is considered specific for neurosecretory material[3].

Results and discussion. In all the 4 catfishes examined, caudal neurosecretory cells are distributed in the spinal cord in the region of the last 3–10 vertebrae, in front of the urophysial swelling. Some of these cells are relatively very large (about 100 µm × 40 µm) and distinctly bipolar, and in these neurosecretory granules, staining with acid violet[3], are discernible not only in the soma and the caudal processes but also in the rostral processes (figures 1–3). It is evident that neurosecretory material produced in the cells passes into the 2 processes. Further, endothelial capillaries are found to make close contact with all parts of the cells viz. the soma, the proximal part of the caudal process, and the rostral process (figure 2). These capillaries arise from blood vessels which supply the posterior part of the spinal cord independently of the blood supply to the urophysial swelling. We are thus led to believe that, unlike those of the

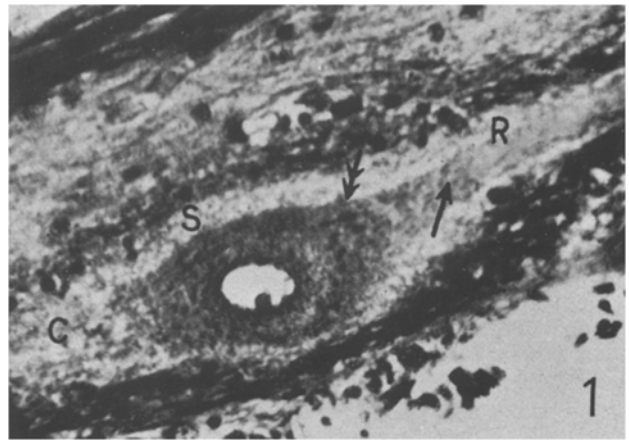

Fig. 1. A typical bipolar cell of *Heteropneustes fossilis* showing the caudal (C) and the rostral (R) process. Note the neurosecretory grains in the soma (double head arrow) and the rostral process (single arrow). × 600.

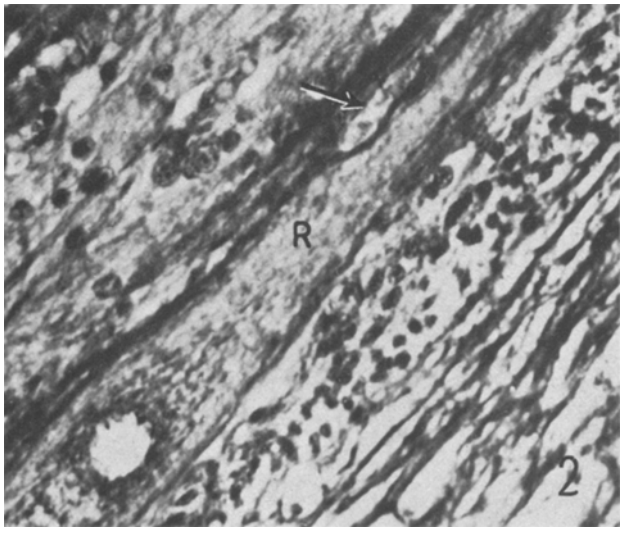

Fig. 2. Same as figure 1 showing an intimate contact between a blood capillary and the rostral process (arrow). × 600.

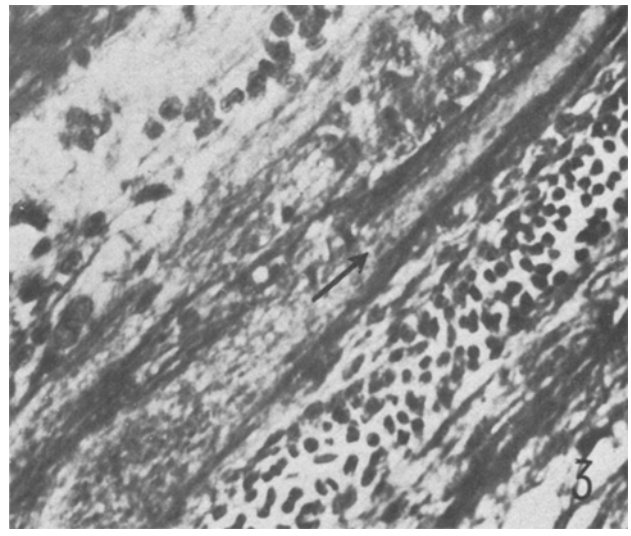

Fig. 3. Same as figure 2, showing neurosecretory grains in the rostral process (arrow). × 600.

common carp and roach, in the catfishes, the rostral processes are also associated with the transmission of the neurosecretory substance.

It may be recalled that in these catfishes, as compared to ordinary teleosts, the posterior part of the spinal cord, in which the neurosecretory cells are situated is more heavily vascularized. It seems likely that unlike the caudal process, the rostral process might be doing the job independent of the agency of the neurohaemal organ, the urophysis. This mediation of rostral processes in the transmission of the neurosecretory substance may be looked upon as a device to supplement the activity of the caudal processes in the event of faster rate of synthesis of the neurosecretory material in the bipolar neurosecretory cells, which are about 4 times larger than the ordinary neurosecretory cells. It is also possible that the rostral process reflects a more primitive mode of transmission of neurosecretory material comparable to that obtaining in primitive bony fish group, the Chondrostei. In Acipenseridae[4] a urophysis is lacking and the neurosecretory cells, unlike those of teleosts, discharge their neurosecretory material into the blood vessels of the meninx in the spinal cord.

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The effects of legume seed extracts on plant virus infection

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Summary. Extracts from the seeds of 15 species of legume inhibited the infection of plants by viruses. Extracts could be divided into those with marked inhibitory activity reducible on heating and those with less marked inhibitory activity which increased on heating. Evidence is given to suggest that seed extracts contain both virus inhibitors and augmenters and that the inhibitors are high molecular weight proteins possibly related to lectins.

Although numerous plants extracts have proved inhibitory to the replication of plant viruses, relatively few reports of the effects of seed extracts have been made[1].

Following the observations that some seed extracts may enhance virus local lesion production whilst others cause inhibition, a theory was proposed to account for the variability in the seed transmission of viruses based on the concept of seeds containing a mixture of virus-enhancing and virus-inhibiting compounds[2]. In order to examine this theory further a range of legume seeds was studied.

Materials and methods. Whole seeds from 15 species of legume were each ground to a powder and 1.0 g samples mixed with 10 ml water. After 10 min the slurry was centrifuged at 3000 × g for 15 min to remove cell debris.

The clear supernatant was mixed with an equal volume of tobacco necrosis virus (TNV) prepared by the method of Kassanis[3] in 0.06 M phosphate buffer pH 7.0. Inoculations were made onto the leaves of 13-day-old french bean plants (*Phaseolus vulgaris* L. cv. the Prince) using 600 grit carborundum as an abrasive. Similar inoculations were made